

# Theory of Numbers (Math 116)

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California State University, Fresno

Instructor: Travis Kelm

Email: [tkelm@csufresno.edu](mailto:tkelm@csufresno.edu)

WWW: [zimmer.csufresno.edu/~tkelm/teaching/math116/](http://zimmer.csufresno.edu/~tkelm/teaching/math116/)

Office: 345 Peters

Phone: 278-4910

Office Hours: To Be Announced

**Course Description:** In elementary number theory, integers are studied without use of techniques from other mathematical fields. Questions of divisibility, use of the Euclidean algorithm to compute greatest common divisors, integer factorizations into prime numbers, investigation of perfect numbers and congruences belong here. Several important discoveries of this field are Fermat's little theorem, Euler's theorem, the Chinese remainder theorem and the law of quadratic reciprocity. The properties of multiplicative functions such as the Möbius function, Euler's  $\phi$  function, integer sequences, factorials and Fibonacci numbers all also fall into this area.

**Course Prerequisites:** Math 111

## Course Materials:

- Textbook: *Elementary Number Theory and its Applications* by Kenneth Rosen, 5th Edition.

**Homework:** Homework is by far the most important aspect of this course. Learning to write proofs is like learning a new language; you must not only learn your vocabulary, but also immerse yourself in the new tongue. It is impossible to learn to write proofs simply by watching others do it, so it is imperative that you practice as many problems as you can and ask questions as often as necessary. Writing mathematics well is a craft, aim to hone it!

- Paper Homework: To prevent the misplacement of your papers, always **staple** your homework together and **label** it with the section number. This is not optional. If you do not have a stapler go get one today. If more than one assignment is due on the same day, please **label them** and **keep them separate** (i.e. do not write two different homeworks on the same sheet of paper). This is not optional. The grader will deduct points if you cannot follow these simple directions. For your own protection you should keep all your old assignments. They make excellent study aids!
- Homework Drafts: Would you turn in the rough draft of your essay on dialectical materialism in your English class? *Don't be ridiculous!* The same goes for your paper homework. Solve most problems on scratch paper first. Then transfer the "good stuff" onto a final draft. Paper homework that is not organized and legible will receive a zero.
- Late Homework: Paper homework must be given to me or delivered to my office by 6 p.m. on the due date. Late assignments will **not** be accepted but I will drop your lowest homework grade.

**Quizzes:** We will have a 10 minute quiz at the *beginning of class every Thursday* except on the first day of classes and on Midterm Exam days. Your lowest quiz score will be dropped.

**Midterms:** We will have examinations during the first hour of class on the following days:

- **Thursday, 15 February** (Week 5)
- **Thursday, 22 March** (Week 10)
- **Thursday, 3 May** (Week 16)

**Final Exam:** The final exam will be on **Thursday, 17 May from 5:45 PM – 7:45 PM**. If this time creates a conflict for you then you must see me immediately. Rescheduling final exams is very difficult.

## Examination Policies:

- Every examination should be considered cumulative.
- No make-up exams will be given. (See **Drop your lowest category** below.)

## Course grade based on:

Homework	In Class Work (Quizzes, Worksheets, etc.)	Midterm 1	Midterm 2	Midterm 3	Final
20%	20%	20%	20%	20%	20%

**Drop your lowest category:** As you can see the percentages above add up to 120%. As a result your lowest percentage from among the first six categories will be dropped. For example if you bomb (or miss) one exam, that exam will be dropped – Just like it never happened!

\* Travis reserves the right to make any necessary changes.

**Learning Differently:** If you have a medical, psychiatric, or learning disability and require accommodations in this class, let me know early in the semester or as soon as you are eligible. You will first need to provide documentation of your disability to Services to Students with Disabilities located in Room 5 of the University Center (next to the Bucket). Their phone number is 278-2811.

**Classroom Etiquette:** Let's face it. You look like a dork when your Dukes of Hazzard ringtone goes off in class. When class is in session your one and only focus must be on learning. Please aid in eliminating classroom disruptions by turning off your cell phone, arriving on time, not leaving early, and by participating fully in any group work.

**Avoid the Dark Side:** The University takes cheating very seriously and the policy regarding cheating is quite clear. Cheating carries a potential penalty of expulsion from the University. Moreover, cheating would not make your mother proud. So don't do it!